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ATTORNEY DOCKET NO. 10992125-2

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Inventor(s):** Andreas N. Dorsel

**Serial No.:** 10/036,999 **Examiner:** Betty J. Forman

**Filing Date:** December 21, 2001 **Group Art Unit:** 1634

**Title:** INTERROGATING MULTI-FEATURED ARRAYS

**COMMISSIONER FOR PATENTS**
**P.O. Box 1450**
**Alexandria VA 22313-1450**

## TRANSMITTAL OF APPEAL BRIEF

**Sir:**

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 09-29-2005 .

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) **$500.00**.

**(complete (a) or (b) as applicable)**

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)(1)-(5)) for the total number of months checked below:

| | | |
|---|---|---|
| ☐ | one month | $ 120.00 |
| ☐ | two months | $ 450.00 |
| ☐ | three months | $1020.00 |
| ☐ | four months | $1590.00 |

☐ The extension fee has already been filled in this application.

☒ (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **50-1078** the sum of $500.00 . At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **50-1078** pursuant to 37 CFR 1.25.

A duplicate copy of this transmittal letter is enclosed.

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Respectfully submitted,

Andreas N. Dorsel

By

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Date: 11-29-2005

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|---|---|
| **APPELLANTS' BRIEF** | |
| Address to:<br>Mail Stop Appeal Brief-Patents<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, VA 22313-1450 | |
| Application Number | 10/036,999 |
| Confirmation Number | 6346 |
| Attorney Docket No. | 10992125-2 |
| Filing Date | Dec. 21,2001 |
| First Named Inventor | Dorsel, Andreas N. |
| Examiner | Forman, Betty J. |
| Group Art | 1634 |
| *Interrogating Multi-Featured Arrays* | |

Sir:

This Brief is filed in support of Applicants' appeal from the Examiner's Rejection dated August 18, 2005. No claims have been allowed, and Claims 1-5, 7-11 and 18-20 are pending. Claims 1-5,7-11 and 18-20 are appealed. A Notice of Appeal was filed on Sept. 29, 2005.

The Board of Appeals and Interferences has jurisdiction over this appeal pursuant to 35 U.S.C. §134.

The Commissioner is hereby authorized to charge deposit account number 50-1078, reference no. 10992125-2 to cover any fee required under 37 C.F.R. §1.17(c) for filing Applicants' brief. In the event that the fee transmittal or other papers are separated from this document and/or other fees or relief are required, Applicants petition for such relief, including extensions of time, and authorize the Commissioner to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 which may be required by this paper, or to credit any overpayment, to deposit account number 50-1078, reference no. 10992125-2.

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## TABLE OF CONTENTS

## REAL PARTY IN INTEREST

The inventors named on this patent application assigned their entire rights to the invention to Agilent Technologies, Inc.

## RELATED APPEALS AND INTERFERENCES

There are currently no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal.

## STATUS OF CLAIMS

The present application was filed on December 21, 2001 with Claims 1-17. During prosecution, Claims 6 and 12-17 were canceled, Claims 18-20 were added, and Claims 1,2,3,5,7, and 18 were amended. Accordingly, Claims 1-5,7-11 and 18-20 are pending in the present application, all of which are appealed herein.

## STATUS OF AMENDMENTS

No amendments to the Claims were filed subsequent to issuance of the Final Rejection.

## SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention is drawn to methods of scanning an addressable array of multiple biopolymeric features of different moieties, for example, different polynucleotide sequences (such as DNA or RNA sequences).

Below is a description of each appealed claim and where support for each can be found in the specification (listed in parentheses).

Independent Claim 1 claims a method comprising: 1) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array (see the specification at pg.7, lines 23-27; pg.10, lines 23-24); 2) detecting signals from respective scanned sites emitted in response to the interrogating light (see the specification at pg.10, lines 15-20); and 3) decreasing power of the interrogating light for a first site on the array package during the scanning wherein the first site is outside an area occupied by the array (see the specification at pg.12, lines 25-32; pg.14, lines 7-17).

Independent Claim 5 claims a method comprising: 1) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array (see the specification at pg.7, lines 23-27; pg.10, lines 23-24); 2) detecting signals from respective scanned sites emitted in response to the interrogating light (see the specification at pg.10, lines 15-20); and 3) altering power of the interrogating light for a first site on the array package during scanning wherein the first site is an array feature and the interrogating light power is altered based on the signal emitted from the first site, when the interrogating light initially illuminates the first site (see the specification at pg.8, line 21 through pg.9, line 5; pg.12, lines 25-32).

Independent Claim 7 claims a method comprising: 1) prior to scanning an interrogating light across an array package, calibrating an interrogating light power versus a control signal characteristic from a light system which provides the interrogating light of a power which varies in response to the control signal characteristic (see the specification at pg.12, lines 4-24); 2) following step (1), scanning the interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array (see the specification at pg.7, lines 23-27; pg.10, lines 23-24); 3) detecting signals from respective scanned sites emitted in response to the interrogating light (see the specification at pg.10, lines 15-20); and 4) altering the interrogating light power for a first site on the array package during the array scanning using the calibration of step (1) (see the specification at pg. 12, lines 4-24), based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined range absent the altering, wherein the interrogating light power is altered during a row scan of the interrogating light (see the specification at pg. 12, line 25 through pg. 13, line 8).

Claim 8 claims the method of Claim 7 additionally comprising repeating steps (1) through (4) for each of multiple array packages (see the specification at pg.15, lines 1-8).

Claim 9 claims the method of Claim 7 in which the light system includes a light source and an optical attenuator through which light from the source passes to provide the interrogating light, and wherein the control signal comprises a signal for the optical attenuator which provides variable attenuation in response to the characteristic of the control signal (see the specification at pg.10, lines 5-12).

Claim 10 claims the method of claim 7 in which the interrogating light power is reduced based on a determination that the emitted signal from the first site will exceed a predetermined value (see the specification at pg. 13, lines 1-8).

Claim 11 claims the method of Claim 10 in which the determination is based on the emitted signal detected from the first site (see the specification at pg. 12, lines 25-32).

Independent Claim 18 claims a method comprising: 1) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array (see the specification at pg.7, lines 23-27; pg.10, lines 23-24); 2) detecting signals from respective scanned sites emitted in response to the interrogating light (see the specification at pg.10, lines 15-20); and 3) altering power of the interrogating light for a first site on the array package during array scanning based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined intensity range absent the altering, wherein the interrogating light power is altered during a row scan of the interrogating light (see the specification at pg.12, line 25 through pg.13, line 8).

Claim 2 claims the method of Claim 18 in which the interrogating light power is reduced based on a determination that the emitted signal from the first site will exceed a predetermined value (see the specification at pg.13, lines 1-8).

Claim 3 claims the method of Claim 18 in which the interrogating light power is increased based on a determination that the emitted signal from the first site will be below a predetermined value (see the specification at pg.12, line 25 through pg.13, line 8).

Claim 4 claims the method of Claim 3 in which the determination is based on the emitted signal detected from the first site (see the specification at pg.12, lines 25-32).

Claim 19 claims the method of Claim 18 in which the sites are multiple features of the array arranged in rows (see the specification at pg. 10, lines 23-25).

Claim 20 claims the method of Claim 18 in which the interrogating light is scanned row by row across the array package (see the specification at pg.10, line 25 through pg. 11, line 2).

## GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Claims 1,5,7 and 10-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lehman et al. (U.S. Patent No. 5,237,172) in view of Brower (U.S. Patent No. 5,167,704).

II. Claims 1-5 and 18-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219).

III. Claims 7-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219) and Lehman et al. (U.S. Patent No. 5,237,172).

## ARGUMENT

I. Claims 1,5,7 and 10-11 are not obvious under 35 U.S.C. §103(a) over Lehman et al. (U.S. Patent No. 5,237,172) in view of Brower (U.S. Patent No. 5,167,704).

With respect to rejections made under 35 U.S.C. § 103, M.P.E.P. § 2142 states:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

It is respectfully submitted that the Examiner's *prima facie* case of obviousness is deficient because the combined teachings of the cited prior art fail to teach or suggest all the claim limitations of the rejected claims.

The Examiner asserts that Lehman et al. teach a document scanning method that discloses the claimed array scanning method except that the moieties being scanned in Lehman et al. are not biopolymers but rather ink on page in the form of letters. To remedy this deficiency, the Examiner cites Brower et al. for their asserted teaching of biopolymer-based inks that one might use to print letters on a substrate (e.g., paper) to scan with the method of Lehman et al.

In rejecting the claims, the Examiner asserts that Lehman et al. teach a scanning method that includes the element of altering power of the interrogating light during scanning as is

claimed in independent Claim 1 (i.e., for a first site that is outside an area occupied by the array), independent Claim 5 (i.e., when the site is an array feature), and independent Claim 7 and dependent claims 10 and 11 (i.e., in a calibration method). However, the Appellants submit that Lehman et al. fails to teach or suggest altering power of the interrogating light because the entirety of Lehman et al. is drawn to altering power of controllers of the detectors, not the interrogating light.

To demonstrate this, Figure 1A of Lehman et al., which provides an overview of the Lehman's disclosure, is reproduced below as well as its description in the specification (col. 5, lines 23-36).

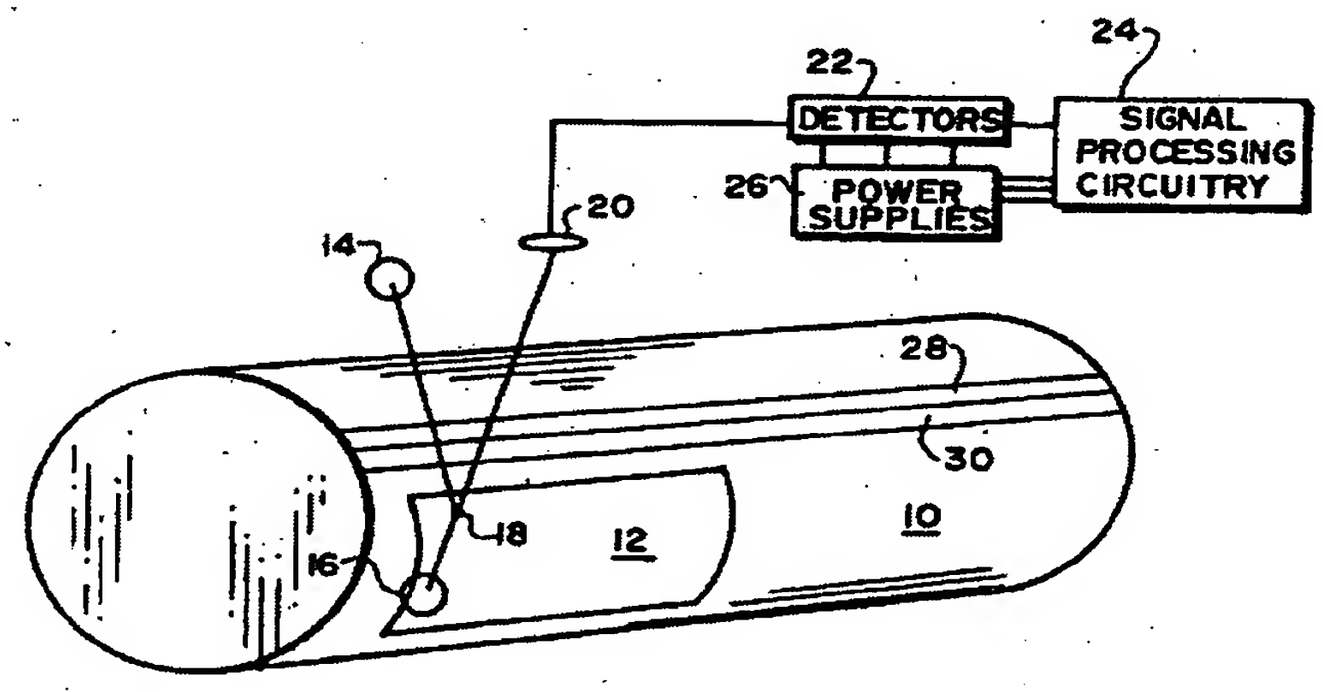


FIG. IA

In FIG. 1, a transparent rotary, thin-walled drum 10 on which a document 12 is mounted for scanning is illuminated by either a first **light source 14** exterior to the drum (in the case of reflection scanning) or by a **second light source 16** interior to the drum (in the case of transmission scanning). The light sources illuminate a defined spot 18 on the document, and the reflected or transmitted light from this spot is imaged by a **lens 20 and transmitted to an electro-optic detector 22 for processing by a signal processing circuitry 24**. A power supply 26 (which, as described more fully below, in fact comprises one independently adjustable supply for each color to be scanned) supplies the requisite power for the detector 22.

In the above figure and its description, the interrogating light sources shown (elements 14 and 16) have no controlling elements associated with them at all. Rather, it is the detectors (i.e., the electro optic detector element 22) which have the controlling elements associated with them. As such, this figure and its description make it clear, as does the entirety of Lehman et

al., that the document scanning methods disclosed therein are drawn to controlling the detectors via adjustments to the power supplies (element 26) and the signal processing circuitry (element 24) connected thereto, and not to adjusting the interrogating light power as is claimed in the subject application. Therefore, Lehman et al. provide no teaching with regard to a method of scanning in which the interrogating light power is adjusted during a scanning procedure.

Therefore, the Appellants submit that in addition to failing to teach or suggest scanning distinct biopolymers (as the Examiner acknowledges), Lehman et al. also fail to teach or suggest altering interrogating light power in any way.

To remedy the deficiencies in Lehman et al., the Examiner cites Brower et al. The Examiner asserts that the biopolymer ink disclosed therein remedies the deficiencies acknowledged by the Examiner.

In response, the Appellant submits that all of the rejected claims include the element of scanning "an addressable array of multiple biopolymeric features of different moieties".

This element is defined on page 7, lines 23-27 of the specification as follows:

> An "addressable array" includes any one or two dimensional arrangement of discrete regions (or "features") **bearing particular moieties** (for example, different polynucleotide sequences) associated with that region and positioned at particular predetermined locations on the substrate (each such location being an "address"). *(emphasis added)*

As such, the "addressable array of multiple biopolymeric features of different moieties" is very different from letters printed on paper in which the same ink is used to print each letter (which is what is being scanned in the methods of Lehman et al.). In the latter case, each feature (or letter) is made with the same biopolymeric moiety, not a distinct biopolymeric moiety as is claimed. Furthermore, neither Lehman et al. nor Brower et al. disclose an addressable array, i.e. one in which the biopolymeric moieties are positioned at predetermined locations on the substrate. It appears that the Examiner is attempting to equate different letter shapes (i.e., different letters on a page) with different features comprising different moieties (e.g., different sequences of nucleic acids on a substrate). The Appellants submit that different letters are not equivalent to different features because different letters are made of the same ink.

Furthermore, Brower et al. was cited solely for the teaching of soy ink, and as such they also fail to remedy the second deficiency in the teaching of Lehman et al., specifically adjusting

the interrogating light power during scanning.

Therefore, in view of the significant deficiencies in the teachings of Lehman et al. and the failure of Brower et al. to remedy those deficiencies, the Applicants submit that a *prima facie* case of obvious has not been established and respectfully request reversal of this rejection.

II. Claims 1-5 and 18-20 are not obvious under 35 U.S.C. §103(a) over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219).

It is respectfully submitted that the Examiner's *prima facie* case of obviousness is deficient because the combined teachings of the cited prior art fail to teach each and every claim limitation found in the claims of the instant application. Below are the contentions of the Appellants with respect to the grounds of rejection as stated above, with a separate subheading for sets of claims argued together.

*Claim 1*

Independent Claim 1 specifies an array scanning method that includes decreasing power of the interrogating light for a first site on the array package during scanning wherein the first site is outside an area occupied by the array. The interrogating light power is decreased at a site that is not within the addressable array area.

In making this rejection, the Examiner refers to col. 8, lines 11-17 as teaching decreasing interrogating light power for a first site on the array package during the array scanning. The entire paragraph that includes this cited section reads as follows:

> Referring now to FIG. 5, a system 11 optionally includes a power modulator 500 that controls laser excitation sources 12a and 14a, to essentially turn the lasers 12 and 14 off for some fraction of the time that the system is scanning across a scan line. The system thus performs low-resolution scanning on a per-scan-line basis, that is, pixel-by-pixel, **as well as over the calibration area**. Specifically, the system turns off the lasers for a fraction of the scanning of each element, or dot, in the scan line. As discussed, the system need not have determined the locations of the individual elements in the micro-array, as long as the width, or diameters; of the elements are known. The system then turns the lasers 12 and 14 off for times that translate to a fraction of the width of each of the elements. (emphasis added)

As the Examiner indicates, col. 6 lines 26-30 describes what is meant by calibration area, which reads:

> Once the position of the micro-array 42 is determined, the user selects a **calibration area, which may be the entire micro-array or some portion of**

> **the array** (step 404). The user preferably selects a portion of the micro-array for which the system produces either saturated signals or signals that indicate the brightest dots. The area may be selected by drawing a box around the area on the screen. (emphasis added)

Finally, the Examiner cites elements B-D of Claim 1 which read:

> B. scanning a first scan line of a **predetermined calibration area** of a sample using the excitation signal;
> C. determining if signals corresponding to N pixels in the first scan line are saturated;
> D. if the signals are saturated reducing the excitation signal power by a predetermined factor; (emphasis added)

As is evident from these passages, the area being scanned **is the calibration area**. The Examiner asserts that the calibration area is "physically distinct from the remaining portions of the microarray" and thus meets the element of Claim 1 specifying that the site being scanned is outside the area occupied by the array.

However, the above passages (especially col. 6 lines 23-30) demonstrate that the Examiner's understanding is incorrect. Rather, the calibration area is specifically chosen from the area occupied by the array, either the entirety or a portion thereof (as stated in the above paragraph, the calibration area "may be the entire micro-array or some portion of the array..."). As such, Bengtsson et al. do not teach the element of Claim 1 in which power of the interrogating light is decreased for a first site on the array package during scanning wherein the first site is **outside an area occupied by the array**.

The Examiner acknowledges that Bengtsson et al. does not teach scanning arrays of distinct biopolymers. To remedy this deficiency, the Examiner cites Rava et al.

However, the Appellants submit that Rava et al. fails to remedy the fundamental deficiency in Bengtsson in making Claim 1 obvious. Namely, Rava also does not teach decreasing power of the interrogating light for a first site on the array package during scanning wherein the first site is outside an area occupied by the array.

*Claims 2-5 and 18-20*

Independent Claim 5 specifies an array scanning method in which the interrogating light power is altered for a first site on the array package during scanning, in which the first site is an array feature. Specifically, the interrogating light power is altered based on the signal emitted from a first site when the interrogating light initially illuminates the first site. Independent Claim 18, and Claims 2-4 and 19-20 that depend therefrom, specify altering power of the interrogating

light for a first site based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined intensity range absent the altering, wherein the interrogating light power is altered during a row scan of the interrogating light.

In other words, Claims 2-5 and 18-20 specify that adjustment to the interrogating light power occurs during the process of scanning the scan line, not after completing the scanning of the scan line. This method allows power to be adjusted before the interrogating light contacts the remainder of the feature so that useful data can still be obtained from that feature during scanning.

In rejecting these claims, the Examiner asserts that Bengtsson et al. teach all the elements of the claimed scanning methods except for scanning arrays of distinct biopolymers. To remedy this deficiency, the Examiner cites Rava et al.

In making this rejection, the Examiner cites col. 5, lines 43-47 of Bengtsson et al. which the Examiner asserts teaches that power is altered based on the signal detected from the interrogated area. This section reads:

> As discussed in more detail below, the system **scans a scan line** 301 and automatically adjusts the levels to avoid saturation, re-scanning the scan line 301 as necessary to automatically readjust one or both of the levels. *(emphasis added)*

From the above passage, the method of Bengtsson et al. involves scanning an entire line followed by adjusting the levels (e.g., attenuator and detector gain levels). As such, the Applicants respectfully submit that this citation does not teach or suggest that the interrogating power is altered based on the signal emitted from a first site which is an array feature **during** scanning, i.e., before completion of scanning the scan line, as is claimed.

Furthermore, nowhere in the remaining passages or figures cited by the Examiner (i.e., Figure 3; col. 5 lines 49-64; col. 7, line 61 to col. 8, line 5; col. 8 lines 14-18; col. 8, lines 11-23) in Bengtsson et al. is this element of the claims taught. Indeed, as shown in Figure 4, element 408, the interrogating light power is adjusted only after completion of scanning an entire scan line.

One particular section of Bengtsson et al. that the Examiner repeatedly cites as teaching adjusting power in response to illumination of a dot or based on location of the dot is col. 8, lines 14-18. The paragraph containing this citation was reproduced above, but for clarity it is shown again below:

> Referring now to FIG. 5, a system 11 optionally includes a power modulator 500 that controls laser excitation sources 12a and 14a, to essentially turn the

> lasers 12 and 14 off for some fraction of the time that the system is scanning across a scan line. The system thus performs low-resolution scanning on a per-scan-line basis, that is, pixel-by-pixel, as well as over the calibration area. Specifically, **the system turns off the lasers for a fraction of the scanning of each element, or dot, in the scan line. As discussed, the system need not have determined the locations of the individual elements in the micro-array, as long as the width, or diameters, of the elements are known. The system then turns the lasers 12 and 14 off for times that translate to a fraction of the width of each of the elements**. (emphasis added)

The Examiner asserts that this section teaches that the power is altered in response to the signal detected from a feature on the array or based on location of the feature. However, as is highlighted in bold, this section teaches no such elements. This section merely discloses that the interrogating light power can be shut off and on during a scanning of the calibration area such that the entirety of a line of a feature is not scanned. Importantly, this section states that the system need not know the placement of the elements during such a scan. Rather, as long as the system knows the approximate width of an element, it can vary the power in a pre-determined pattern that will illuminate a part of all of the elements in the scan line. In addition, there is no teaching that the turning on and off of the laser is related in any way **to the detected signal** from an illuminated element (or feature).

As such, the Appellants submit that this section fails to teach altering interrogating light power during scanning in response to signal detected from a feature (or element) on an array or based on the location of the first site as the Examiner asserts.

In addition, in the *Summary of the Invention* section, Bengtsson et al. describe their scanning method as follows (col. 2, lines 8-39):

> The inventive system uses a low-resolution scanning operation, to automatically adjust the sensitivity of the system. The system performs a low-resolution scanning operation by **scanning a line, automatically and iteratively setting the levels of optical signal power and detector gain, skipping a plurality of lines and scanning a next line**, adjusting the levels as appropriate, skipping a plurality of lines and scanning a next line, and so forth. After the system sensitivities have been set, the calibrated system then scans all the lines of the sample to collect data. The calibrated system thus scans for the first time the lines that were skipped during the low resolution scanning operation. Accordingly, there is no risk of photo-bleaching or otherwise damaging of these skipped lines, and accurate data can be collected from them.
>
> The system first sets the detector gain to maximum and the excitation signal power to a predetermined default value, such as half-power, and **scans a first scan line of a selected area of the sample**. The system then

determines if the signals associated with "N" adjacent pixels in the scan line are saturated, that is, if the signals that correspond to N adjacent pixels are above a maximum data signal value. If so, the system reduces the laser excitation signal power by a predetermined factor, for example, by a factor of two. The system next **re-scans the line and determines if N adjacent pixels are still saturated**. If so, the system again reduces the excitation signal power by the predetermined factor. **The system continues to re-scan the line until either fewer than N adjacent pixels produce saturated signals, or the excitation signal power has been reduced to a predetermined minimum power level, for example, to one-quarter of the maximum power**. (emphasis added)

As can be seen from the above passage, the method of Bengtsson et al. is specifically drawn to scanning an entire line in a scan area, adjusting (if necessary) the laser excitation power, and re-scanning the scan line in its entirety. Bengtsson et al. simply does not teach altering the power of interrogating light during scanning based on the signal emitted from a first site or based on the location of the first site.

As with the rejection to Claim 1, the Examiner acknowledges that Bengtsson et al. does not teach scanning arrays of distinct biopolymers. To remedy this deficiency, the Examiner cites Rava et al.

However, the Appellants submit that Rava et al. fails to remedy the fundamental deficiency in Bengtsson in making Claims 2-5 and 18-20 obvious, namely altering the power of interrogating light during scanning based on the signal emitted from a first site or based on the location of the first site.

Therefore, the Appellants submit the combined teachings of Bengtsson et al. and Rava et al. fail establish a *prima facie* case of obviousness because they fail to teach or suggest each and every element of Claims 1-5 and 18-20. As such, the Appellants respectfully request reversal of this rejection.

III. Claims 7-11 are not obvious under 35 U.S.C. §103(a) over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219) and Lehman et al. (U.S. Patent No. 5,237,172).

It is respectfully submitted that the Examiner's *prima facie* case of obviousness is deficient because the combined teachings of the cited prior art fail to teach each and every claim limitation found in the claims of the instant application. Below are the contentions of the

Appellants with respect to the grounds of rejection as stated above, with a separate subheading for each group of claims presented.

Independent Claim 7 and dependent Claims 8-11 specify a method for array scanning that is similar to that claimed in independent Claims 5 and 18 in that it includes the element of altering the interrogating light power during a row scan of the interrogating light based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined range absent the altering. Claim 7 includes the additional element of a "pre-calibration" step in which the interrogating light power is calibrated versus a control signal characteristic from a light system (step (a) of Claim 7).

The Examiner asserts that Bengtsson et al. teach the elements of the claimed invention except for 1) the pre-calibration step, and 2) scanning addressable arrays of different moieties. To remedy these deficiencies, the Examiner cites Lehman et al., which asssertedly teach pre-calibration as is claimed, and Rava et al., which assertedly teaches scanning addressable arrays of different moieties.

However, as discussed in detail above, Bengtsson et al. fails to teach or suggest altering power of the interrogating light for a first site during a row scan based on location of the first site or on the signal emitted from the first site.

Furthermore, also as discussed above, Lehman et al. is not drawn to scanning methods in which the interrogating light power is altered in any way as is the claimed invention. Rather, the methods of Lehman et al. are drawn to altering characteristics of control elements for the detection element (e.g., controllers that alter the characteristics of photomultiplier tubes in the detector). As such, the Appellants submit that Lehman et al. fail to remedy the interrogating light pre-calibration step as is claimed.

Finally, the asserted teachings of Rava et al., which was cited solely for its teaching of biopolymeric arrays of different moieties, fail remedy any of these fundamental deficiencies in the teachings of Bengtsson et al. and Lehman et al. in making Claims 7-11 obvious.

Therefore, the Appellants submit the combined teachings of Bengtsson et al., Lehman et al. and Rava et al. fail establish a *prima facie* case of obviousness because they fail to teach or suggest each and every element of Claims 7-11, namely 1) pre-calibration of an interrogating light and 2) altering power of the interrogating light during scanning based on location of the first site or based on the signal emitted from the first site. As such, the Appellants respectfully request reversal of this rejection.

**SUMMARY**

I. Claims 1,5,7 and 10-11 are not obvious under 35 U.S.C. §103(a) over Lehman et al. (U.S. Patent No. 5,237,172) in view of Brower (U.S. Patent No. 5,167,704) because the references fail to teach or suggest a method of scanning an addressable array of multiple bipolymeric features of different moieties in which the power of the interrogating light is altered.

II. Claims 1-5 and 18-20 are not obvious under 35 U.S.C. §103(a) over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219) because the references fail to teach or suggest 1) decreasing power of the interrogating light for a first site on the array package during scanning wherein the first site is outside an area occupied by the array (Claim 1), and 2) altering the power of interrogating light during scanning based on the signal emitted from a first site or based on location of the first site (Claims 2-5 and 18-20).

III. Claims 7-11 are not obvious under 35 U.S.C. §103(a) over Bengtsson (U.S. Patent No. 6,078,390) in view of Rava et al. (U.S. Patent No. 5,874,219) and Lehman et al. (U.S. Patent No. 5,237,172) because these references fail to teach or suggest 1) pre-calibration of an interrogating light and 2) altering the power of interrogating light during scanning based on the signal emitted from a first site or based on location of the first site.

**RELIEF REQUESTED**

The Applicants respectfully request that all rejections of Claims 1-5, 7-11 and 18-20 be reversed and that the application be remanded to the Examiner with instructions to issue a Notice of Allowance.

Respectfully submitted,

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**CLAIMS APPENDIX**

1. A method comprising:

(a) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array;

(b) detecting signals from respective scanned sites emitted in response to the interrogating light; and

(c) decreasing power of the interrogating light for a first site on the array package during the scanning wherein the first site is outside an area occupied by the array.

2. A method according to claim 18 wherein the interrogating light power is reduced based on a determination that the emitted signal from the first site will exceed a predetermined value.

3. A method according to claim 18 wherein the interrogating light power is increased based on a determination that the emitted signal from the first site will be below a predetermined value.

4. A method according to claim 3 wherein the determination is based on the emitted signal detected from the first site.

5. A method comprising:

(a) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array;

(b) detecting signals from respective scanned sites emitted in response to the interrogating light; and

(c) altering power of the interrogating light for a first site on the array package during scanning;

wherein the first site is an array feature; and

wherein the interrogating light power is altered based on the signal emitted from the first site, when the interrogating light initially illuminates the first site.

7. A method comprising:

(a) prior to scanning an interrogating light across an array package, calibrating an interrogating light power versus a control signal characteristic from a light system which provides the interrogating light of a power which varies in response to the control signal characteristic;

(b) following step (a), scanning the interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array;

(c) detecting signals from respective scanned sites emitted in response to the interrogating light; and

(d) altering the interrogating light power for a first site on the array package during the array scanning using the calibration of step (a), based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined range absent the altering;

wherein the interrogating light power is altered during a row scan of the interrogating light.

8. A method according to claim 7 additionally comprising repeating steps (a) through (d) for each of multiple array packages.

9. A method according to claim 7 wherein the light system includes a light source and an optical attenuator through which light from the source passes to provide the interrogating light, and wherein the control signal comprises a signal for the optical attenuator which provides variable attenuation in response to the characteristic of the control signal.

10. A method according to claim 7 wherein the interrogating light power is reduced based on a determination that the emitted signal from the first site will exceed a predetermined value.

11. A method according to claim 10 wherein the determination is based on the emitted signal detected from the first site.

18. A method comprising:

(a) scanning an interrogating light across multiple sites on an array package including an addressable array of multiple biopolymeric features of different moieties, which scanned sites include multiple features of the array;

(b) detecting signals from respective scanned sites emitted in response to the interrogating light; and

(c) altering power of the interrogating light for a first site on the array package during array scanning based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined intensity range absent the altering;

wherein the interrogating light power is altered during a row scan of the interrogating light.

19. A method according to claim 18 wherein the sites are multiple features of the array arranged in rows.

20. A method according to claim 18 wherein the interrogating light is scanned row by row across the array package.

## EVIDENCE APPENDIX

No evidence that qualifies under this heading has been submitted during the prosecution of this application, and as such it is left blank.

**RELATED PROCEEDINGS APPENDIX**

As stated in the *Related Appeals and Interferences* section above, there are no other appeals or interferences known to Appellants, the undersigned Appellants' representative, or the assignee to whom the inventors assigned their rights in the instant case, which would directly affect or be directly affected by, or have a bearing on the Board's decision in the instant appeal. As such this section is left blank.